K113809

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SECTION 8
510(k) SUMMARY

AUG 17 2012

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92. The assigned 510(k) number is K113809.

807.92 (a)(1): Name: Hitachi Chemical Diagnostics
Address: 630 Clyde Court
Mountain View, CA 94043

Phone: (650) 961 5501
FAX: (650) 969 2745
Contact: Mr. Bunichiro Nakajima

807.92 (a)(2): Device name- trade name and common name, and classification

Trade name:
Hitachi Clinical Analyzer S TEST Reagent Cartridge C-Reactive Protein (CRP)

Common Name: Routine chemistry analyzer for C-Reactive Protein (CRP)

Classifications: 21 CFR § 866.5270- C-reactive protein immunological test system (CRP)

807.92 (a)(3): Identification of the legally marketed predicate devices

Reagent Test:
Roche C-Reactive Protein Latex (CRPLX)- k073277

Instrument Platform:
Roche Cobas 8000 Modular Series Analyzer - k100853
Alfa Wasserman Diagnostic Technologies S40 Clinical Analyzer - k091413

807.92 (a)(4): Device Description
The Hitachi Clinical Analyzer is an automatic, bench-top, wet chemistry system intended for use in clinical laboratories or physician office laboratories. The instrument consists of a desktop analyzer unit, an operations screen that prompts the user for operation input and displays data, a printer, and a unit cover. The analyzer unit includes a single probe, an incubation rotor, carousels for sample cups and reagent cartridges, and a multi-wavelength photometer. The single-use reagent cartridges may be placed in any configuration on the carousel, allowing the user to develop any test panel where the reagent cartridges are available.

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The S TEST reagent cartridges are made of plastic and include two small reservoirs capable of holding two separate reagents (R1 and R2), separated by a reaction cell/photometric cuvette. The cartridges also include a dot code label that contains all chemistry parameters, calibration factors, and other production-related information, e.g., expiration dating. The dimensions of the reagent cartridges are: 13.5 mm (W) × 28 mm (D) × 20.2 mm (H).

System operation: After the sample cup is placed into the carousel, the analyzer pipettes the sample, pipettes the reagent, and mixes (stirs) the sample and reagent together. After the sample and reagent react in the incubator bath, the analyzer measures the absorbance of the sample, and based on the absorbance of the reactions, it calculates the concentration of analyte in the sample. The test system can measure analytes in serum or plasma and results are available in approximately 15 minutes per test. This submission is for reagent cartridge test systems for CRP.

Chemistry reactions:

CRP in samples causes an antigen-antibody reaction with latex sensitizes with Goat anti-human C-Reactive Protein antibody to induce agglutination. The concentration of CRP can be determined by measuring this agglutination as the amount of change in absorbance.

CRP + Goat anti-human C-reactive protein antibody coated latex ⟶ Agglutination due to antigen-antibody reaction

807.92 (a)(5): Intended Use

The Hitachi Clinical Analyzer S TEST reagent cartridge CRP is intended for the quantitative measurement of C-reactive protein in serum, lithium heparin plasma, K3 EDTA plasma, and sodium citrate plasma. The test system is intended for use in clinical laboratories or physician office laboratories. CRP measurements aid in the evaluation of injury to body tissues, and infection and inflammatory disorders. For *in vitro* diagnostic use only.

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807.92 (a)(6): Technological Similarities and Differences to the Predicate
The following chart describes similarities and differences between the two test systems.

Characteristic	Hitachi S TEST Systems	PREDICATE(S)
Instrument Platform	Hitachi Clinical Analyzer	Roche cobas 8000 – K100853
		also, Alfa Wasserman S40- K091413
C-Reactive Protein (CRP)	K number- K113809	Roche C-Reactive Protein Latex (CRPLX) K073277
Device Class, Regulation Code	Class II, 21 CFR 866.5270	Same
Classification Product Code	DCN	Same
Intended Use	Quantitative determination of CRP	Same
Testing Environment	Physician office or clinical lab	Clinical lab- Roche cobas POL/Clin Lab - Alfa Wasserman
Test Principle	Latex agglutination turbidimetric immunoassay	Particle-enhanced immunoturbidimetric assay
Specimen Type	Human serum or plasma	Same
Reportable Range	1 to 150 mg/L	1 to 250 mg/L
Detection Wavelength	570/800 nm	-/546 nm
Detection Limit	1 mg/L	Same
Linearity	1 to 154 mg/L	1 to 250 mg/L
Precision	%CVs range from 7.7% (mean 15.6 mg/L) to 2.8% (mean 122.1 mg/L)	%CVs range from 0.9% to 2.5% (from product labeling)

807.92 (b)(1): Brief Description of Nonclinical Data
A series of studies were performed that evaluated the following nonclinical performance characteristics for each analyte: analytical sensitivity (limits of detection), linearity, 20-day in-house precision, interference testing, in-house method comparisons, and matrices comparison between serum and heparin plasma.

Analytical Sensitivity (Limits of Detection)
The study followed CLSI EP17-A, and the sensitivity was found to be 0.7 mg/L.

Linearity
The study followed CLSI EP-6A , and the range of linearity was 1 to 154 mg/L.

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20-day In-house Precision
The studies followed CLSI EP5-A2, where three levels of samples were each tested in two runs, twice a day, for 20 days. The results were as follows:

Precision Summary:

CRP- Low, Level 1, Summary

CRP	Within-Run	Total
Mean (mg/L)	6.0	6.0
SD (mg/L)	0.34	0.44
%CV	5.7%	7.3%

CRP- Middle, Level 2, Summary

CRP	Within-Run	Total
Mean (mg/dL)	15.6	15.6
SD (mg/dL)	1.16	1.20
%CV	7.4%	7.7%

CRP- High, Level 3, Summary

CRP	Within-Run	Total
Mean (mg/L)	122.1	122.1
SD (mg/L)	3.01	3.41
%CV	2.5%	2.8%

Interference Testing (per CLSI EP7-A2)
The data demonstrated that the C-reactive protein test system was not affected by high levels of the following substances at the levels noted:

Hemoglobin: no interference up to 1000 mg/dL
Unconjugated bilirubin: no interference up to 50 mg/dL
Lipemia: no interference up to 2000 mg/dL
Ascorbic acid: no interference up to 50 mg/dL

Lack of interference was defined as recoveries between 90% and 110% of the neat value, and assay performance claims were established on the HITACHI Clinical Analyzer by testing two serum pools containing approximately 12 mg/L and 80 mg/L C-reactive protein.

Method Comparison (per CLSI EP9-A2)
A total of 88 clinical specimens, spanning the dynamic range (1 to 125 mg/L), were assayed in singleton and in a blinded fashion by both the Hitachi system and a standard laboratory system. Regression statistics are based on the balance of the paired results, and the data were as follows:

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CRP Regression Statistics:

n	r	Slope (95% CI)	y-intercept (95% CI)	X mean	Y mean
88	0.994	0.99 (0.96 to 1.01)	0.14 (-0.64 to 0.92)	15 mg/L	15 mg/L

Matrices Comparisons

A study was performed to validate the use of various plasma types, as an alternative to serum, for the Hitachi Clinical Analyzer with S TEST reagent cartridge for C-Reactive Protein. The plasma types were sodium citrate, lithium heparin, and K3 EDTA. Forty-five (45) matched serum/plasma samples that spanned the dynamic range (1 to 123 mg/L) were assayed in singleton and the results were compared using least squares liner regression (plasma = y-axis, each type). The performance characteristics were as follows.

N = 45

Range (serum) = 1 to 123 mg/L

	Lithium Heparin Plasma	K3 EDTA Plasma	Na Citrate Plasma
Slope (95% CIs)	1.00 (0.98 to 1.01)	0.99 (0.97 to 1.00)	1.00 (0.99 to 1.01)
y-intercept (95% CIs)	-0.12 (-0.75 to 0.52)	0.06 (-0.55 to 0.67)	-0.26 (-0.82 to 0.30)
r	0.999	0.999	0.999

807.92 (b)(2): Brief Description of Clinical Data

Studies for precision and method comparison (accuracy) were performed at three external POL-type sites to evaluate the Hitachi Clinical Analyzer with S TEST reagent cartridges for CRP in one of its targeted intended use environments, the physician's office laboratory.

For the external site precision study, each site received three blinded serum samples (the Precision Panel, labeled A, B, and C) that were chosen to represent low, middle, and high concentrations of CRP. Each sample was assayed six times per day for five days, reporting 30 results per level per analyte. Precision estimates for total precision were as follows:

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CRP (mg/L)
n = 30 replicates per sample per site

Site	Sample	Mean	Within-run Precision		Total Precision	
			SD (mg/L)	%CV	SD (mg/L)	%CV
Site 1	A	3.9	0.2	5.9%	0.3	6.6%
Site 2	A	3.6	0.4	12.4%	0.5	14.1%
Site 3	A	3.9	0.4	11.6%	0.4	11.2%
Site 1	B	49.7	1.9	3.8%	1.7	3.5%
Site 2	B	52.3	1.5	2.8%	1.5	2.9%
Site 3	B	54.1	1.2	2.3%	2.1	3.9%
Site 1	C	95.5	5.1	5.3%	5.3	5.6%
Site 2	C	92.3	4.0	4.3%	6.5	7.1%
Site 3	C	94.0	3.5	3.7%	4.0	4.2%

A series of approximately 55 serum specimens with C-Reactive Protein values ranging from 1 mg/L to 130 mg/L were assayed on the HITACHI Clinical Analyzer at three sites using S TEST CRP (y) and a comparative method as the reference method (x). Linear regression analysis (least squares) yielded the following results:

DATA SUMMARY- C-reactive protein mg/L

Site #	n	Range	Regression Equation	"r"	CI* Slope	CI* Intercept
1	56	1 to 122	y = 1.02x + 0.1	0.998	1.00 to 1.04	-0.5 to 0.6
2	56	1 to 130	y = 1.06x - 0.2	0.999	1.05 to 1.08	-0.6 to 0.2
3	55	1 to 125	y = 1.03x + 0.2	0.998	1.01 to 1.05	-0.4 to 0.8

*95% Confidential Interval

807.92 (b)(3): Conclusions from Nonclinical and Clinical Testing
Nonclinical and clinical testing was performed for the Hitachi Clinical Analyzer with reagent cartridges for CRP. The test system was shown to be safe and effective for its intended use.

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration

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Hitachi Chemical Diagnostics, Inc.
c/o Ms. Erika B. Ammirati
Managing Director
575 Shirlynn Court
Los Altos, CA 94022

AUG 17 2012

Re: k113809
Trade/Device Name: Hitachi Clinical Analyzer S TEST Reagent Cartridge CRP
Regulation Number: 21 CFR §866.5270
Regulation Name: C-reactive protein immunological test system
Regulatory Class: Class II
Product Code: DCN
Dated: August 10, 2012
Received: August 14, 2012

Dear Ms. Ammirati:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of

medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html.

Sincerely yours,

Leena Philip

for Maria M. Chan, Ph.D.
Director
Division of Immunology and Hematology Devices
Office of *In Vitro* Diagnostic Device Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): k113809

Device Name: Hitachi Clinical Analyzer S TEST Reagent Cartridge CRP

Indications For Use:
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Prescription Use ____X___ AND/OR Over-The-Counter Use

(Part 21 CFR 801 Subpart D) (21 CFR 807 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostic Devices (OIVD)

Division Sign-Off

Office of In Vitro Diagnostic
Device Evaluation and Safety

510K K113809